

A Taxonomic Study on Four Subfamilies of Tettigoniidae (Orthoptera, Ensifera) in Korea

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ABSTRACT A taxonomic study of the four subfamilies of Korean Tettigoniidae was presented. As the result, each of these subfamilies have only a few members in Korea, and eight species from four subfamilies are recognized as follows; one of Bradyporinae, one of Mecopodinae, five of Meconematinae and one species of Listroscelidinae. Two of which are reported for the first time in Korea. [*Mecopoda niponensis* De Haan and *Cosmetura fenestrata* Yamasaki] A key, distributional data and some of taxonomic consideration are provided.

Key words : Taxonomy, Tettigoniidae, Ensifera, Orthoptera, Korea

INTRODUCTION

The subfamilies, Bradyporinae, Mecopodinae, Meconematinae and Listroscelidinae of Tettigoniidae (Orthoptera) are recognized each about 190, 150, 340 and 210 species throughout the world (Naskrecki and Otte, 1999). They are well distinguished from other subfamilies of Tettigoniidae by the characters as follow; The Bradyporinae have antennae inserted below the lower margins of eyes and tegmina shorter than body. The Mecopodinae have a robust body of large size (more than 30 mm), open tympana and well developed leaflike tegmina. The Meconematinae have a feeble body of small size (less than 25 mm) and more complex structures of male genitalia. The Listroscelidinae have a rostrum narrower than antennal scape and movable long spines of fore and mid tibia.

First record from Korea of these subfamilies was made by Walker (1869), that was deal with three species from 'Corea', 1) *Decticus tenebrosus* (= *Mecopoda elongata*), 2) *Xiphidium exemptum*, and 3) *Tedla sellata* (= *Hexacentrus mundus*). But this report regarded as seems to be have a problem of label confusion on the collection by 'Captain Belcher'. The members of four subfamilies are only a few in Korea, thus a taxonomic study of them was not presented until now. Even though, these are some-

times considered as independent families of Grylloptera (Kevan, 1982; Jin and Xia, 1994). In this paper, we followed the taxonomic system of Naskrecki and Otte (1999).

As the result of this study, eight species from four subfamilies are recognized as follows; one of Bradyporinae, one of Mecopodinae, five of Meconematinae and one species of Listroscelidinae. Two of which are reported for the first time in Korea; *Mecopoda niponensis* De Haan and *Cosmetura fenestrata* Yamasaki. The key, distributional data and some problematic notes are also provided.

The depositories and the provinces of Korea are given in abbreviated form as follows: EU-Ehwa Women's Univ.; GSU-Gyeongsang Univ.; KU-Korea Univ.; NIAST-National Institute of Agricultural Science and Technology; SNU-Seoul National Univ.; SSU-Sungshin Women's Univ.; YNU-Yeongnam Univ.; HB-Hamgyeongbuk-do; GW-Gangwon-do; GG-Gyeonggi-do; CB-Chungcheongbuk-do; CN-Chungcheongnam-do; GB-Gyeongsangbuk-do; GN-Gyeongsangnam-do; JB-Jeollabuk-do; JN-Jeollanam-do; JJ-Jeju-do.

SYSTEMATICS

Subfamily Bradyporinae Kirby

Type genus: *Bradyporus* Charpentier.

Genus *Deracantha* Fischer-Waldheim

Type species: *Gryllus onos* Pallas.

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1. *Deracantha transversa* Uvarov 민충이

Deracantha transversa Uvarov, 1930. Ann. Mag. Nat. Hist. 10(5): 255. Peking, China: Kishida, 1934: 187; Mori, 1935: 7, 16, pl. III. 3, 4, Text-Fig. 6; Cho, 1959: 28, Fig. 25A-B; Čejchan, 1967: 615, Figs. 7, 24; Cho, 1969: 753, pl. 50. Fig. 59a-b, Text-Fig. 6; Lee, 1990: 112.

Callimenus onos: Mori, 1929: 40; Doi, 1932: 37.

Deracantha onos: Mori, 1933: 55; Moon and Yoon, 1993: 56.

Deracantha onos onos: Kwon and Huh, 1994: 48.

Distribution. Korea (Northwestern part), China, Mongolia.

Remarks. This species was reported firstly in North Korea as *Deracantha* [*Callimenus*] *onos*

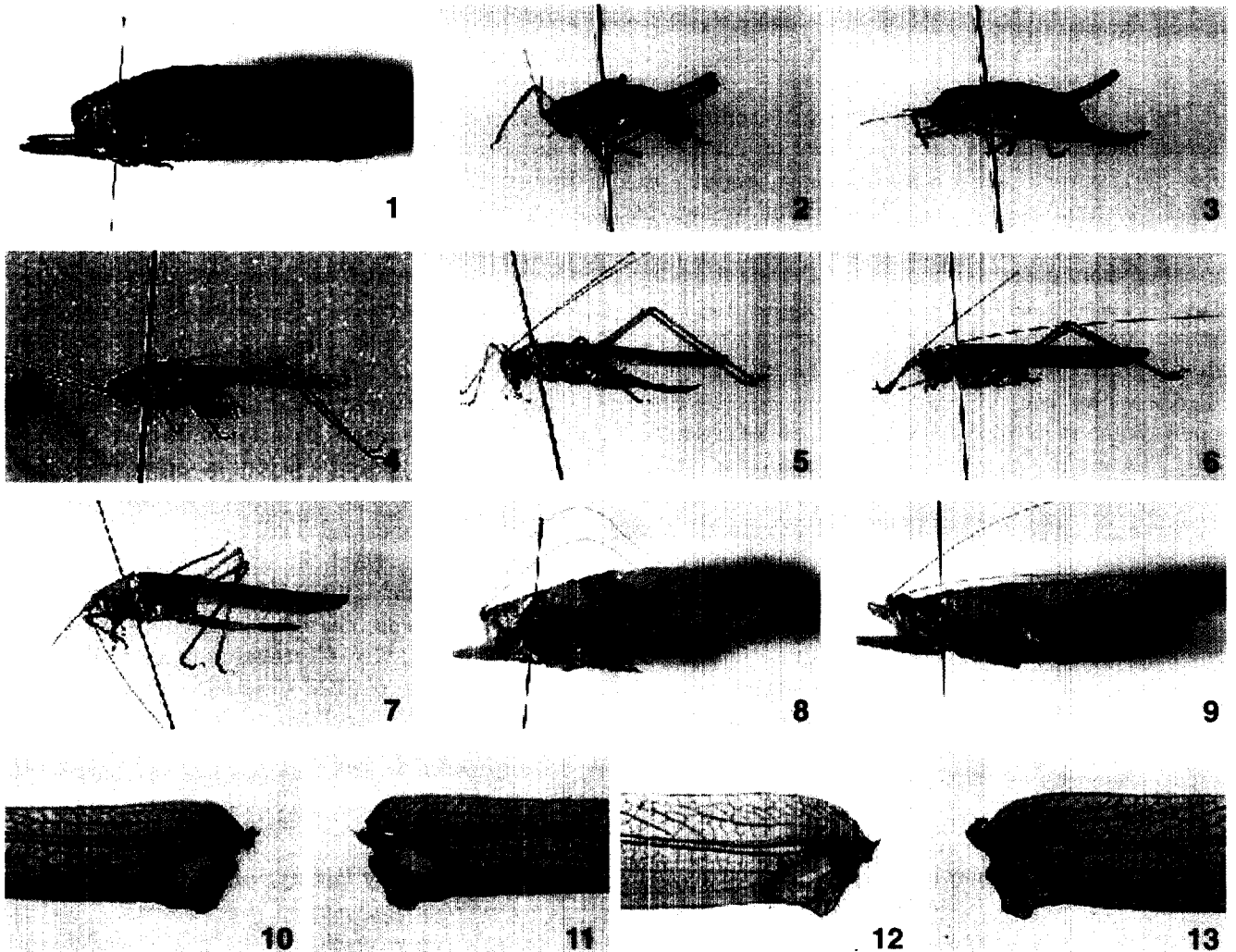
Pallas by Mori (1929), but it was amended as misidentification of *D. transversa* Uvarov (Kishida, 1934; Mori, 1935). All records of *D. onos* from Korea were due to the citation of first identification simply before the new species of Uvarov (1930). Therefore it seems more reasonable using the name *D. transversa* at this paper, based on the historical account and the analysis of above reporters' descriptions.

Subfamily *Mecopodinae* Redtenbacher

Type genus: *Mecopoda* Audinet-Serville.

Genus *Mecopoda* Audinet-Serville

Type species: *Mecopoda maculata* Audinet-Serville.



Figs. 1-9. Lateral view of bodies, 1. *Mecopoda niponensis* (De Haan); 2-3. *Cosmetura fenestrata* Yamasaki; 4-5. *Kuzicus suzukii* (Matsumura et Shiraki); 6-7. *Eoxizicus coreanus* (Bey-Bienko); 8-9. *Hexacentrus unicolor* Audinet-Serville (1, 2, 4, 6, 8. Males; 3, 5, 7, 9. Females). 10-13. Stridulatory apparatus of male, 10-11. *Kuzicus suzukii* (Matsumura et Shiraki); 12-13. *Eoxizicus coreanus* (Bey-Bienko).

1. *Mecopoda niponensis* (De Haan) 철썩기 (신칭) (Fig. 1)

Locusta (Mecopoda) niponensis De Haan, 1842. Temminck, Verhand. Orth. p. 188. Japan.

Mecopoda elongata: Mori, 1933: 55; Cho, 1959: 29, Fig. 26; Cho, 1969: 754, pl 50. Fig. 60; Lee, 1990: 108; Moon and Yoon, 1993: 56. (misidentification)

= *Decticus tenebrosus* Walker 1869. Cat. Derm. Salt. Brit. Mus. 2: 263. Corea (?). [synonym of *Mecopoda elongata* by Karny, 1921]

Korean name. 철썩기 [철석이] (Cho, 1959); 넓적머리여치 (Ju, 1969) under *Mecopoda elongata*.

Diagnosis. Body length from rostrum to tegminal end 44–58 mm, green or sometimes brown coloration, macropterous. Similar to *Mecopoda elongata*, but lateral lobe of pronotum without black patch markedly. Tegmina as long as three times of middle width. Male subgenital plate long and narrow, divided as a pair of lobes. Female ovipositor long and straight with pointed apex.

Material examined: GN-10 males, Ssanggyesa Temple Mt. Jirisan Hwagye-myeon Hadong, 1 IX 2001, Kim (NIAST). JN-3 males 1 female, Mt. Baekyangsan [Hakuyosan] Jangseong, 8 IX-9 X 1921, Hasegawa et al. (NIAST and S.M. Lee's collection); 11 males, *ibid*, 23 VIII-9 IX 1999, Kim (NIAST).

Distribution: Korea (new record), Japan, China.

Remarks: The name *Mecopoda elongata* Linnaeus was used mostly for this species in the early works of Korea and Japan. But the result of specimens examination, all Korean samples are another species *M. niponensis* (De Haan). The first description (Walker, 1869) from 'Corea' was corresponding with *M. elongata* [= *Decticus tenebrosus*], but the report have problems of label confusion on the collection of 'Captain Belcher' which was as the same in the Homoptera pointed out by Lee (1995: 28). The distributional possibility of *M. elongata* to Korea in nature seems to be very rare, because the range of *M. elongata* limited to southeastern pacific line of Japan from Oriental region (Ito et al., 1996).

Subfamily Meconematinae Kirby

Type genus: *Meconema* Audinet-Serville

Key to Known Species of Korean Meconematinae

1. Male micropterous; tegmina almost covered basally by pronotum and female apterous

- *Cosmetura fenestrata* Yamasaki
– Macropterous in both sexes; tegmina full developed 2
2. Male last abdominal tergite simple, without notch and process
..... *Decma improvisum* Gorochov et Kostia
– Male last abdominal tergite complex, with notch and large process 3
3. Male last abdominal tergite with asymmetrical process and cerci
..... *Xiphidiopsis exempta* (Walker)
– Male last abdominal tergite with symmetrical process and cerci 4
4. Pronotum with a longitudinal stripe along median; Male genitalia with button shaped structure.
..... *Kuzicus suzukii* (Matsumura et Shiraki)
– Pronotum with two longitudinal stripe along lateral carinae trace; Male genitalia without button shaped structure
..... *Eoxizicus coreanus* (Bey-Bienko)

Genus *Cosmetura* Yamasaki

Type species: *Cosmetura ficifolia* Yamasaki

1. *Cosmetura fenestrata* Yamasaki

민어리썩새기 (신칭) (Figs. 2-3)

Cosmetura fenestrata Yamasaki, 1983. Mem. natn. Sci. Mus. Tokyo, 16: 137, Figs. 9-15. Mt. Funagata-yama, Ōu Mountain Range, Tōhoku District, Honshu, Japan.

Diagnosis. Body length 8~14 mm, yellowish green coloration. Male micropterous, tegmina mostly covered by pronotum, but female apterous. Male cercus with wide base and large inner tooth. Supra-anal plate strongly swollen at distal part with a small dorsal projection, its apex rounded.

Material examined. GB-2 females, Dodong Ulleungdo, 2 X 1981, Park (S.M. Lee's collection); 1 male, Jeodong Ulleungdo, 1 X 1981, Park (S.M. Lee's collection). GN-2 males 5 females, Jungsan-ri Sicheon-myeon Sancheong, 7-8 IX 1992, Jeon et al. (GSU); 2 males, Mt. Jirisan, 30 IX-1 X 2000, Chae (SNU). JJ-3 females, Mt. Hallasan, 10-11 VIII 1984, Park (S.M. Lee's collection); 1 male, Gwaneumsa Temple, 14 VIII 1990, Park (KU); 1 male 1 female, *ibid*, 10 VIII 2001, Park et al. (NI-AST); 1 female, Eorimok, 15 VIII 1990, Yoon (KU).

Distribution. Korea (new record), Japan.

Genus *Decma* Gorochov

Type species: *Decma stshelkanovtzevi* Gorochov

2. *Decma (Idiodesma) improvisum* Gorochov et *Kostia* 우리어리썩새기

Decma (Idiodesma) improvisum Gorochov et Kostia, 1993. Zoosyst. Rossica, 2(2): 291, Figs. 37-41. Mt. Geumgangsán, GW, North Korea: Naskrecki and Otte, 1999.

Decma improvisum: Kwon et al., 1996: 103.

Distribution. Korea.

Remarks. This species was not available in this study.

Genus *Xiphidiopsis* Redtenbacher

Type species: *Xiphidiopsis fallax* Redtenbacher

3. *Xiphidiopsis* (s. str.) *exempta* (Walker)

나도어리썩새기 (신칭)

Xiphidium exemptum Walker, 1869. Cat. Derm. Salt. Brit. Mus. 2: 274. Corea (?).

Xiphidiopsis exemptum: Lee, 1990: 111; Jin and Xia, 1994: 27.

Xiphidiopsis exempta: Paik et al., 1995: 295.

Xiphidiopsis (s. str.) *exemptus*: Naskrecki and Otte, 1999.

Remarks: Walker (1869) described this species as new based on one female specimen labelled from Corea. Lee (1990) was treated this species as *Kuzicus [Xiphidiopsis] suzukii* (Matsumura et Shiraki), but the result of comparison with holotype's pictures from the illustrated catalog by Naskrecki and Otte (1999) is not same species showed structural differences in ovipositor and subgenital plate. However, in this study, the specimens from Korea was not more found and the first report have the problems of label confusion on the collection as for the same causing with *Mecopoda elongata* (See the remarks of *M. niponensis*). Therefore, the possibility that this species may be originated from other Southeastern Asia is not able to excluded.

Genus *Kuzicus* Gorochov

Type species: *Teratura suzukii* Matsumura et Shiraki

4. *Kuzicus* (s. str.) *suzukii* (Matsumura et Shiraki) 어리썩새기 (Figs. 4-5, 10-11)

Teratura suzukii Matsumura et Shiraki, 1908. J.

Agric. Tohoku Imp. Univ. 3 (1): 48, Taf. I. Fig. IV. a-d. Kyoto, Japan.

Xiphidiopsis suzukii: Doi, 1933: 88; Cho, 1959: 33, Fig. 36; Cho, 1969: 759, pl 51. Fig. 70; Yamasaki, 1982: 122, Figs. 10-15.

Xiphidiopsis suzuki [sic!]: Mori, 1933: 56.

Xiphidiopsis exemptum: Lee, 1990: 111. (misidentification)

Kuzicus (s. str.) *suzukii*: Gorochov, 1993: 72. Figs. 67-74.

Korean name. 어리썩새기 [어리썩새이] (Cho, 1959), 썩새기불이 (Cho, 1969), 가늘이슬여치번터기 (Ju, 1969).

Material examined. GW-1 female, Yeongok-myeon Gangneung, 12 VIII 1995, Seong (SSU); 1 female, Changwon-ri Nam-myeon Yeongwol, 7 IX 1998, Park (NIAST); 1 female, *ibid*, 13 VIII 1999, Kim (NIAST); 1 male 2 females, Balsan-ri Sinbuk-myeon Chuncheon, 25 VIII 1998, (NIAST); 1 male 3 females, *ibid*, 10-25 IX 1998, Park (NIAST). GG-1 female, Guimokgogae Gapyeong, 4 IX 1999, Ryu (YNU); 2 males 1 female, Mt. Godongsan Gapyeong, 9 IX 1980, Jang (SSU); 1 female, Ungogae Gwangju, 23 X 1982, Kim (SSU); 2 males 1 female, Mt. Surisan Gunpo, 5 IX 1996, Lee (S.M. Lee's collection); 1 male, Maseok Namyangju, 17 IX 1988, Jeon (SSU); 3 males 1 female, Mt. Chukryeongsan Sudong, 6-28 IX 1980, Kim (SSU); 1 male, *ibid*, 10 X 1981, Seo (SSU); 1 male, Mt. Gwanggyosan Suwon, 4 IX 1996, Lee (S.M. Lee's collection); 1 male, Mt. Yongmunsan Yangpyeong, 1 IX 1980, Park (SSU); 1 male, *ibid*, 29 IX 1986, Lee (SSU); 1 male, Mt. Gamaksan Paju, 24 VIII 1967, Kim (KU); 1 male 1 female, Sanjeongho Yeongbuk Pocheon, 26 VIII 1984, Park (S.M. Lee's collection); 1 male, Yeongpyeong Pocheon, 18 VIII 1996, (SSU); 1 female, Mt. Cheonmasan Sudong Hwado, 2 VIII 1989, Hwang (SSU); 1 female, Galhyeon-dong Seoul, 20 X 1992, Choi (EU); 1 female, Mt. Dobongsan, 16 IX 1982, Lee (SSU); 1 male, *ibid*, 18 VIII 1983, Lee (SSU); 1 male 3 females, *ibid*, 22 IX-7 X 1984, Ahn et al. (SSU); 1 male, *ibid*, 8 X 1987, Kim (SSU); 1 female, Dongseon-dong Seoul, 20 IX 1979, Jeong (SSU); 1 male, Mt. Bukhansan, 29 IX 1991, Han (SSU); 2 females, Bulgwang-dong Seoul, 28 IX 1993, Huh (SSU); 1 male, Sungshin Univ. Campus, 14 XI 1982, Kang (SSU); 1 female, *ibid*, 4 IX 1999, Kang (SSU); 1 female, Mt. Suraksan, 3 X 1980, Kim (SSU); 1 male, Mt. Yongmasan, 29 VIII 1993, Park (SSU); 1 male 1 female, Wonji-dong Seoul, 14 IX 1985,

Kwon et al. (SSU); 1 male, *ibid*, 8 X 1995, Lee (SSU); 1 male, Jangui-dong Seoul, 31 VIII 1980, Kim (SSU); 3 males 1 female, Mt. Cheong-gyesan, 6 VII-6 IX 1986, Jegal et al. (SSU). GB-1 male 1 female, Mt. Hwaaksan Gaknam-myeon Cheongdo, 15 IX 1998, Park et al. (GSU). GN-1 male, Jangsuam Geoje, 25-26 VIII 1990, Yoon (GSU); 1 female, Saengrim Gimhae, 14 VIII 1987, (GSU); 1 female, Songdeokam Ojeon-ri Obu-myeon Sanchong, 5 IX 1998, Ju (GSU); 1 female, Yongyeon-ri Habuk-myeon Yangsan, 20 VIII 1987, (GSU); 1 female, Jinju, 23 IX 1984, Oh (GSU). JN-1 male, Dosa-ri Daap-myeon Gwang-yang, 19-20. IX. 1998, Ahn (GSU). JJ-1 female, Seonhle, 10 X 1999, Kim (NIAST); 1 male, Jeju, 4 XII 1993, Ahn (NIAST).

Distribution: Korea, Japan, Taiwan, China.

Genus *Eoxizicus* Gorochov

Type species: *Xiphidiopsis kulingensis* Tinkham

5. *Eoxizicus coreanus* (Bey-Bienko)

등줄어리썩새기 (신칭) (Figs. 6-7, 12-13)

Xiphidiopsis coreana Bey-Bienko, 1971. Ent. Rev. Washington, 50: 837, Figs. 23-25. Mt. Palgongsan Daegu, South Korea.

Xizicus (Eoxizicus) coreanus: Gorochov, 1993: 76. Figs. 116-117.

Xizicus (Eoxizicus) coreana: Naskrecki and Otte, 1999.

Eoxizicus coreanus: Liu and Zhang, 2000: 159.

Material examined. GW-1 female, Okgye-myeon Gangneung, 29 X 1999, Namkung (NIAST); 1 male, Gojindong Mt. Geonbongsan, 28 VIII 1990, Lee (SSU); 1 female, Mt. Seoraksan, 24 X 1971, Lee (EU); 1 female, Baekdamsa Temple Mt. Seoraksan, 30 VIII 1984, Park (KU); 1 male, Changwon-ri Nam-myeon Yeongwol, 7 IX 1998, Park (NIAST); 6 males 11 females, Mt. Chiaksan Wonju, 14-15 VIII 1999, Kim et al. (SSU); 1 female, Mt. Geonbongsan Inje, 29 IX 1972, Kim (KU); 9 males 9 females, Malaise trap, Mt. Myeongseongsan Cheolwon, 17 VIII-14 X 1999, Ku (NIAST); 2 females, Sinsulhyeon Cheolwon, 18 VIII 1997, Park (NIAST); 1 male, Chuncheon, 30 X 1997, Lee (NIAST); 1 male, Gangchon Chuncheon, 14 VII 1997, Kim (SSU); 3 males 3 females, Balsan-ri Sinbuk-myeon Chuncheon, 10 VIII-8 X 1998, Park (NIAST). GG-3 males 2 females, Gapyeong, 3 IX 1999, Ryu (YNU); 1 male, Mt. Myeongjisan Gapyeong, 23 IX 1989,

Park (NIAST); 1 female, Gwacheon, 30 VIII 1992, Choi (SSU); 1 male, Mt. Taehwasan Gwangju, 19 VII 1996, Choi (NIAST); 1 male, Yongmi-ri Gwangtan, 2 X 1987, Lee (SSU); 1 male, Mt. Surisan Gunpo, 23 VIII 1986, Jang (NIAST); 1 female, Uri Maseok Namyangju, 29 VIII 1986, Jang (SSU); 1 male, Mt. Suraksan Namyangju, 15 IX 1997, Kim (SSU); 1 female, Mt. Cheonmasan Namyangju, 14 VIII 1977, Kim (KU); 1 male, *ibid*, 21 X 1980, Lee (SSU); 1 female, *ibid*, 13 VIII 1981, Moon (SSU); 1 male, *ibid*, 10 VIII 1990, Jeong (SSU); 1 male, Mt. Soyosan Dongducheon, 6 X 1981, Jang (SSU); 1 female, Bukhansanseong, 12 IX 1991, Kim (SSU); 1 female, Namhansanseong Seongnam, 23 VIII 1997, Jeong (SSU); 1 male, Mt. Cheongyesan Seongnam, 15 VIII 2000, Kang (NIAST); 1 female, Mt. Chukryeongsan Sudong, 28 IX 1980, Jang (SSU); 3 females, Malaise trap, *ibid*, 16 VIII-14 X 1999, Ku (NIAST); 1 male, Mt. Gwanggyosan Suwon, 18 VIII 1999, Jang; 1 female, Light trap, Mt. Yeogisan Suwon, 4 IX 1991, (NIAST); 1 male, Mt. Yongmunsan Yangpyeong, 1 IX 1980, Park (SSU); 1 male, Mt. Yumyeongsan Yangpyeong, 5 VIII 1998, Kang (SSU); 1 female, Echeon, 1 X 1982, Goh (SSU); 1 female, Mt. Gwanaksan, 15 IX 1997, Kim (SSU); 1 female, Mt. Guryongsan, 9 IX 1990, Lee (SSU); 1 female, Mt. Gusan-dong Seoul, 27 X 1992, Kim (SSU); 1 female, Mt. Kachisan, 21 VIII 1997, Ham (SSU); 1 male, Mt. Namsan, 11 VIII 1984, Kim (SSU); 1 female, Mt. Daemosan, 1 VIII 1996, Lee (SSU); 1 male, Mt. Dobongsan, 16 IX 1982, Kim (SSU); 2 females, *ibid*, 29 VIII-4 IX 1992, Jeon et al. (SSU); 2 males, *ibid*, 12 IX 1993, Kim (SSU); 1 male, Mt. Bukhansan, 30 VII 1998, Kim (SSU); 1 female, Mt. Suraksan, 4 IX 1995, Cho (SSU); 1 male, Ehwa Univ. campus, 24 X 1992, Han (EU); 2 males, Mt. Cheongyesan, 15 VIII 1988, Kim (SSU); 2 females, *ibid*, 17 IX-7 X 1995, An et al. (SSU); 1 male, *ibid*, 13 VIII 1998, Kim (SSU). CB-1 female, Goesan, 9 X 1987, Ahn (NIAST); 2 males, Mt. Guryongsan Boeun, 23 VIII 1997, Park (SSU); 1 male, Deokgok Jecheon, 28 VIII 1998, Jeon (SSU); 1 male, Mt. Wolaksan Jecheon, 15 VIII 1989, Kim (SSU). CN-1 female, Mt. Gyeryongsan Gongju, 8 X 1994, Kim (SSU); 1 male, *ibid*, 5 VIII 2000, Kim (NIAST). GB-1 female, Huibangsa Mt. Sobaeksan Yeongpung, 4 VIII 1994, Kim (KU); 6 males 18 females, Malaise trap, *ibid*, 13 VIII-15 X 1999, Ku (NIAST); 8 males 5 females, Mt. Baekamsan Uljin, 11. VIII. 1999, Ku (NIAST). GN-1 female, Mt. Bukbyeong-

san Dongbu Geoje, 29. VIII. 2000, Lee (NIAST); 1 male, Mt. Gamaksan Ogye-ri Namsang-myeon Geochang, 5 IX 1998, Park (GSU); 1 male, Mt. Odusan Osan-ri Sangri-myeon Goseong, 7-8 IX 1996, Kim (GSU); 1 male 2 females, Mt. Waryongsan Sacheon, 18-19 VIII 1998, Park et al. (GSU); 1 male, Chodong-ri Anui-myeon Hamyang, 22 VIII 1998, Ahn (GSU). JB-1 female, Maljae Buan, 13 IX 1998, Ryu (YNU).

Distribution. Korea.

Subfamily Listroscolidinae Kirby

Type genus: *Listroscolis* Audinet-Serville

Genus *Hexacentrus* Audinet-Serville

Type species: *Hexacentrus unicolor* Audinet-Serville

1. *Hexacentrus unicolor* Audinet-Serville

배짱이 (Figs. 8-9)

Hexacentrus unicolor Audinet-Serville, 1831. Ann. Sci. Nat. Paris, XXII: 146. Java, Indonesia: Lee, 1990: 108; Moon and Yoon, 1993: 56; Inagaki et al., 1990: Figs. C-D; Inagaki et al., 1994: Abb 1. B, D, F, Abb 2. B.

Hexacentrus japonicus: Doi, 1932: 37; Kamijo, 1933: 49; Mori, 1933: 55; Cho, 1969: 754, pl. 50. Fig. 61, Text-Fig. 7; Inagaki et al., 1990: Figs. A-B; Inagaki et al., 1994: Abb 1 A, C, E, Abb 2 A.

Hexacentrus yaponicus [sic!]: Cho, 1959: 29, Fig. 27.

= *Tedla sellata* Walker, 1869. Cat. Derm. Salt. Brit. Mus. 2: 393. Corea (?). [synonym of *Hexacentrus mundus* (Walker) by Karny, 1912]

Material examined. GW-1 male, Gangneung, 12 VIII 1995, Seong (SSU); 1 female, Changwon-ri Nam-myeon Yeongwol, 7 IX 1998, Park (NIAST); 2 males, Malaise trap, Mt. Myeongseongsan Cheolwon, 17 VIII-14 X 1999, Ku (NIAST); 1 male, Gangchon Chuncheon, 23 VIII 1986, Choi (SSU); 1 male 11 females, Balsan-ri Sinbuk-myeon Chuncheon, 10 VIII-8 X 1998, Jang (NIAST); 1 female, Nam-myeon Hongcheon, 9 IX 1990, Lee (SSU); 1 female, Noil-ri Bukbang-myeon Hongcheon, 18 IX 1993, Kim (NIAST); 2 males, Mt. Baekunsan Hwacheon, 6-7 VIII 1984, Nam et al. (KU); 1 male, *ibid*, 15 VIII 1996, Yoo (SSU). GG-1 male, Mt. Myeongjisan Gapyeong, 23 IX 1989, Oh (SSU); 1 female, Mt. Unaksan Gapyeong, 29 IX-1 X 1971, (SSU); 2 males, Ganghwa, 11-18 VIII

1969, Yoon (EU); 1 female, Byeokje Goyang, 16 IX 1997, Chae (SSU); 1 female, Mt. Cheongyesan Gwacheon, 12 IX 1991, Cho (SSU); 1 male, Gwangneung, 5 IX 1954, Han (EU); 2 females, Mt. Mugapsan Gwangju, 5 VIII-15 IX 1991, Park (SSU); 1 male, Ungogae Gwangju, 17 IX 1981, Park (SSU); 1 male, Mt. Taehwasan Gwangju, 19 VII 1996, Choi (NIAST); 1 male, Bogwangsa Temple Gwangtan, 17 IX 1977, Lee (EU); 1 male, Gimpo, 3 IX 1954, Choi (EU); 1 male, Mt. Suraksan Namyangju, 15 IX 1991, Kim (SSU); 3 males 2 females, Mt. Chukryeongsan Namyangju, 10 VIII-14 X 1999, Kang et al. (SSU); 1 male, Deokso, 3 X 1971, Lee (EU); 1 male, Mt. Soyosan Dongducheon, 18 VIII 1968, So (EU); 1 female, Munsan, 9 X 1972, Kim (KU); 1 male 2 females, Namhansanseong Seongnam, 12-19 IX 1981, Kim et al. (SSU); 1 male, Songchu, 8 VIII 1971, Lim (EU); 1 male, Suwon [Suigen], 7 VIII 1932, Nakayama (NIAST); 1 female, Light trap, *ibid*, 1 VII 1997, (NIAST); 1 male, Anseong, 12-15 VIII 1994, Kim (SSU); 1 male, Mt. Yongmunsan Yangpyeong, 13 VIII 1987, Kim (SSU); 2 males, Mt. Yumyeongsan Yangpyeong, 3 VIII 1998, Sohn (SSU); 1 female, Uijeongbu, 29 IX 1984, Ahn (SSU); 1 female, Jakyakdo Ongjin Incheon, 26 IX 1992, Oh et al. (SSU); 1 male, Jangheung Goyang, 28 IX 1991, Paik (SSU); 1 female, Gemchon Paju, 29 VIII 1990, Choi (SSU); 1 male 1 female, Seolma-ri Paju, 18 VIII 1984, Kim (SSU); 1 male 1 female, Mt. Cheonmasan Pyeongnae, 13 VIII-1 X 1981, Kim et al. (SSU); 1 male, Anjung Pyeongtaek, 29 VI 1992, Moon (SSU); 1 male, Pocheon, 30 VII 1993, Choi (NIAST); 1 male, Yeongpyeong Yeongjeong Pocheon, 18 VIII 1996, Kim (SSU); 1 female, Hanam, 14 VIII 1997, Kim (SSU); 1 female, Hyangnam-myeon Hwaseong, 18 IX 1988, Lee (SSU); 1 female, Mt. Garibong-dong Seoul, 16 IX 1979, Yoon; 1 female, Gaepo-dong Seoul, 22 X 1995, Ryu; 1 male, Mt. Gaehwasan, 25 VII 1998, Kim; 1 male, Gugi-dong Seoul, 7 IX 1986, Lee; 1 male, Guui-dong Seoul, 11 VIII 1995, Cho; 1 male 1 female, Mt. Daemosan, 17-29 VIII 1996, Kang et al.; 1 female, *ibid*, 29 VIII 1998, Kang; 1 male, Mt. Dobongsan, 5 VIII 1974, Ku (EU); 1 male, Mia-dong Seoul, 10 VIII 1977, Yoo (EU); 1 male, Bongcheon-dong Seoul, 8 VIII 1990, Lee; 1 female, Mt. Bukhansan, 30 IX 1971, Lee (EU); 2 males, Bulgwang-dong, 25 IX 1971, Han (EU); 1 male 3 females, Mt. Bulamsan, 14 VII-13 IX 1986, Jegal et al. (SSU); 2 male 1 female, Sangdo-dong Seoul, 12-16 VIII 1981, Han; 1 female, Seoul Univ. Cam-

pus, 28 VIII 1998, Lee (SSU); 1 male, Seokgwan-dong Seoul, 15 VII 1971, Park (EU); 2 females, Mt. Suraksan, 3 X 1980, Kim (SSU); 1 male, Sinrim-dong, 17 VIII 1985, Park; 1 female, Ui-dong Seoul, 4 IX 1981, Jeon; 1 female, Wolgye-dong Seoul, 12 VIII 1985, Park; 1 male, Jahamun Seoul, 28 VII 1971, Lee; 1 male, Jeonngong-dong Seoul, 10 VII 1986, Lee; 1 male, Jingwan-dong Seoul, 27 VII 1990, Jeong; 1 female, *ibid*, 21 IX 1992, Ham; 1 female, Hangang River, 5 VIII 1995, Kim; 1 male, Hwagok-dong Seoul, 24 VIII 1981, Song; 1 male, Hyochang Park Seoul, 11 VIII 1955, Lee (EU). CB-1 male, Jichon-ri Cheongcheon-myeon Goisan, 6 VIII 1987, Lee (SSU); 1 female, Hwayang-ri Cheongcheon-myeon Goisan, 15 IX 1984, Kim (SSU); 1 male, Yeongdong, 17 VIII 1995, Choi (NIAST); 1 male, Yeongpung, 18 VIII 1986, Min (SSU); 1 male, Okcheon, 14. VIII. 1969, Yuk (EU); 1 male, Mt. Wolaksan Jecheon, 4 VIII 1994, Moon (KU); 1 male 2 females, Cheongju, 10-27 VIII 1960, Jeong (EU). CN-1 male, Mt. Gyeryongsan Gongju, 4 VIII 1973, Kim (KU); 1 female, *ibid*, 19 VIII 1976, Lee (KU); 1 male, Jakgol Gongju, 8 VIII 1982, Kim (SSU); 2 females, Mt. Maninsan Geumsan, 23 VIII 1997, Lim (SSU); 4 males, Dusan-ri Dangjin, 12-17 VIII 1984, Choi (SSU); 3 males, Daejeon, 9-23 VIII 1997, Lim (SSU); 1 female, Daecheon Boryeong, 15 VIII 1997, So (SSU); 1 male, Jiksan, 14 VIII 1971, Park (EU). GB-1 male, Yeongnam Univ. Campus Gyeongsan, 30 VIII 1988, Kim (YNU); 1 male, Daegu, 20 VIII 1971, Kim (EU); 1 male, Bongsan-ri Gongseong-myeon Sangju, 12 VIII 1985, Kim (SSU); 1 male, Yeongdeok, 9 VIII 1996, An (SSU); 1 female, Mt. Juwangsan Cheongsong, 7 VIII 1975, Kim (EU). GN-1 male, Mt. Bukbyeongsan Dongbu Geoje, 29. VIII. 2000, Lee (NIAST); 1 female, Jangmok Geoje, 13 X 1993, Yoon (SSU); 1 male, Gampo Ulju, 12 VIII 1990, Shin (SSU); 1 male, Hongseong, 11 VIII 1961, Park (KU). JB-1 female, Jeonju, 25 X 1995, Lee (NIAST). JN-1 male, Suncheon, 4 VIII 1987, (KU); 1 male, Nohwa Wando, 19 VIII 1982, Jang (SSU); 1 female, Mt. Baegyongsan [Hakuyosan] Jangseong, 9 X 1921, Hasegawa (NIAST); 1 male, Mt. Daedunsan Haenam, 14 VIII 1972, Kim (KU). JJ-1 male, Andeok Valley, 16. VIII. 1990, Han (KU).

Biological note: Life History (Ôshiro et al., 1986).

Distribution: Korea, Japan, Taiwan, China, Indonesia.

Remarks: Both of *Hexacentrus unicolor* Audinet

-Serville and *Hexacentrus japonicus* Karny are even reported in Korea. Even providing the differences to species by several workers (Karny, 1907; Furukawa 1938, 1941), the criteria is practically variable and unstable. Inagaki et al. (1990, 1994) defined both are sibling species with behavioral difference of the calling songs of males and biological same species with hybridization of F1, F2. Therefore external morphological discriminations between them are almost impossible in spite of that microdivergency was given. We should deal them as conspecies in this work based on the conservative concept of discrete species.

On the other side, *Tedla sellata* Walker (1869) was described as new labelled from 'Corea' by 'Captain Belcher'. Lee (1990) was regarded that as *Hexacentrus unicolor*, but which was also treated as synonym of *H. mundus* (Walker) by Karny (1912). Taiwan is the type locality of *H. mundus*, which was not more found in Korea. Probably this species is considered as one undistributed in Korea, thus the report from 'Corea' are may be incorrect (See the remarks of *Mecopoda niponensis* and *Xiphidiopsis exempta*).

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